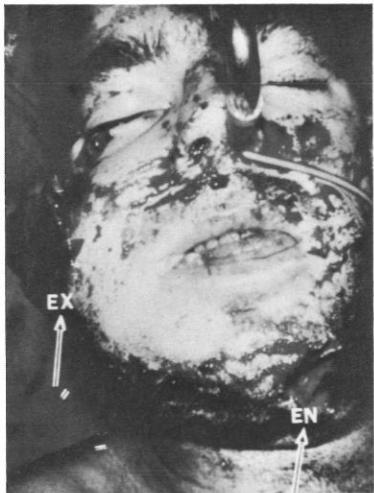


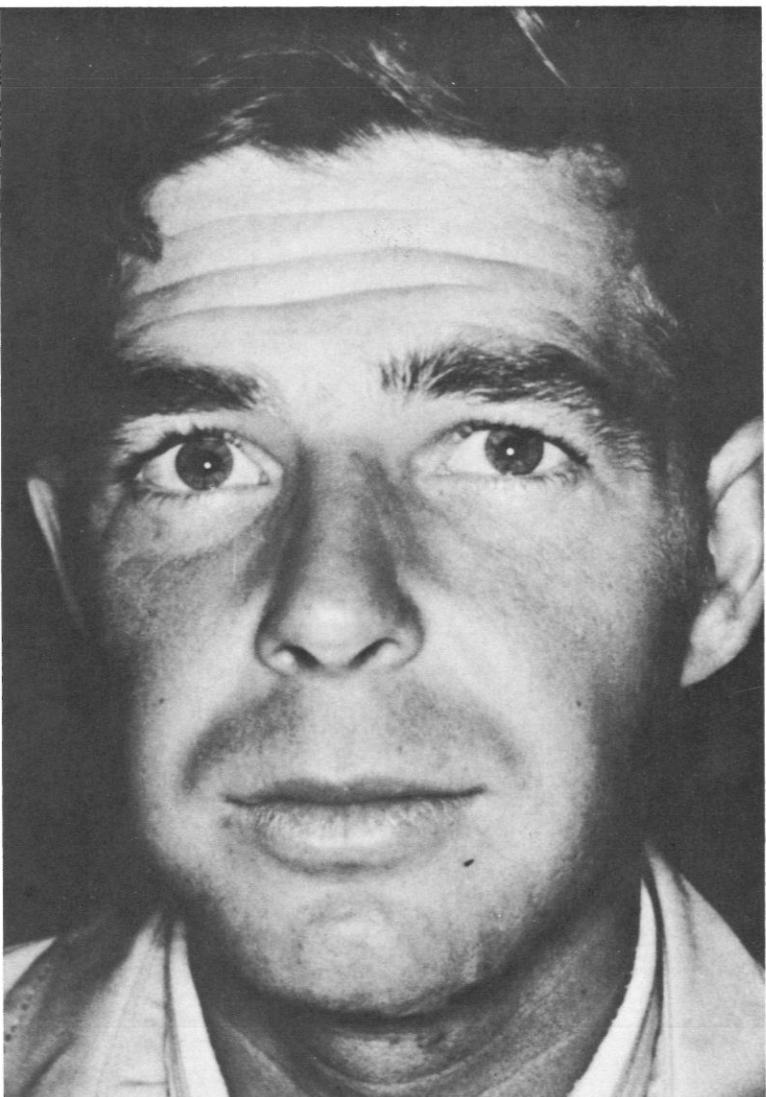
U.S. NAVY MEDICINE

August 1978



Injury . . .

result . . .



NAVY DENTISTRY

(see page 8)

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COVER: This young man received the wound shown at left from fragments of an exploding booby trap in Vietnam. Through extensive work, including bone grafting to restore the large defect in the patient's right jaw, Navy oral surgeons achieved the result at right. For a state-of-the-art report on research in casualty care and other aspects of Navy dentistry, see page 8.

From the Surgeon General

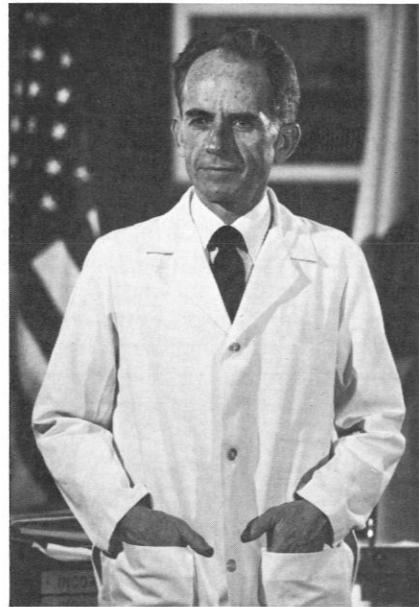
To the Officers of the Navy Dental Corps

Best wishes and congratulations! Birthdays are and should be happy occasions, and this one should be no less.

You can look back upon the sixty-six years of your existence as a Corps with justifiable pride. Reflect with pleasure upon your contributions, through and with the rest of the Medical Department, to the health and welfare of our Navy and Marine Corps.

Progress, innovation and professional growth have characterized your efforts. Your exploration and development of new concepts and new methods of dental health care delivery have pioneered the way for others to follow and have gained for you the respect of both military and civilian communities.

The foregoing comments imply past accomplishments. The second half of a traditional birthday



greeting includes "many happy returns," which is a look to the future. Demands upon your energies and opportunities for your creative ingenuity, as well as requirements for innovative and imaginative leadership, await you. Your glorious past implies an illustrious future.

Thank you for your superb performance. Happy birthday, and many happy returns.

A handwritten signature in black ink, appearing to read "W.P. Arentzen".

W.P. ARENTZEN
Vice Admiral, Medical Corps
United States Navy

Department Rounds

Pharmacy Call System a Hit

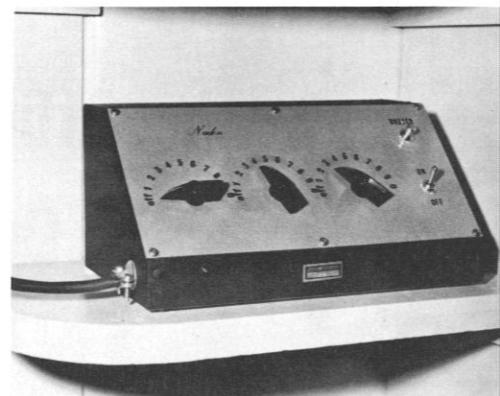
For outpatient pharmacies, providing a rapid, effective, and economical patient-call system to handle high-volume workloads is a continuing problem—one for which improved solutions are constantly sought. No single system can serve as a model for all pharmacies; however, we feel that other facilities may be interested in certain features of our system at NRMC Camp Lejeune.

At the heart of our arrangement is an electronic call system with both visual and audio capabilities. We believe it to be the first such system to be employed by a Navy pharmacy service, and we have found it to be a definite improvement over the traditional public address equipment.

The major element of the \$438 system (from Nadin Industries,

Webster City, Iowa) is a visual display panel, mounted in the patient waiting area. By means of 7-inch-tall illuminated digits, the panel tells patients at a glance that prescriptions up to and including the number displayed have been filled and are ready for pickup. Pharmacy technicians set the number on the visual display by turning three selector switches on a remote control panel located at the outpatient dispensing window. The control panel also has a switch the technician can use to sound a soft "buzz," alerting waiting patients when an additional batch of prescriptions has been filled.

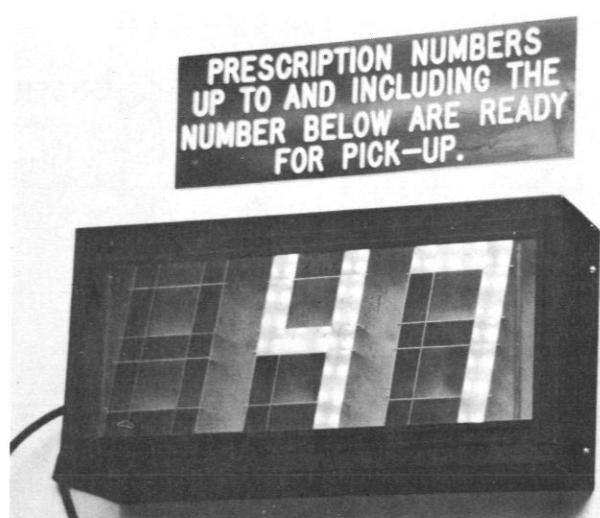
Other elements of the Nadin system are 70 feet of connecting cable and a standard 110-volt electrical cord. Installation of the system in our pharmacy was completed by the



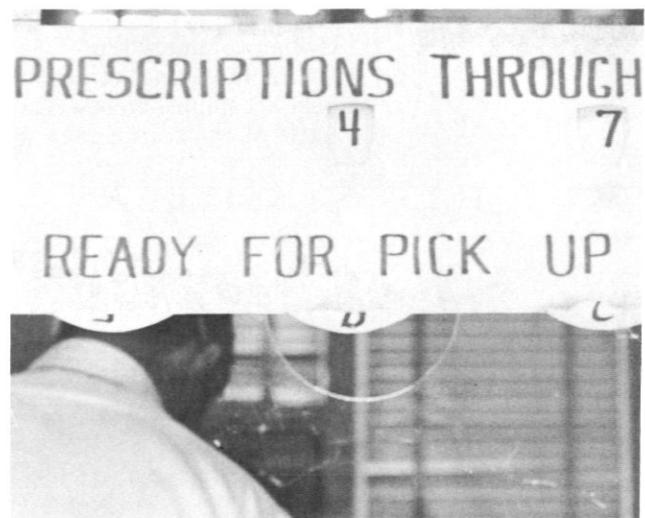
Pharmacy technicians update visual display through selector switches on remote control panel.

hospital's maintenance department in several hours' time.

Ancillary to the Nadin system, as we use it, are a Bates "Lever Movement" numbering machine (\$50) and a constant supply of disposable prescription claim checks. We have kept remnants of our old P.A. paging system to back up the Nadin system in case of breakdown, and



Electronic display panel in pharmacy waiting area.



Hand-operated wheels update sign at dispensing window.

we use the P.A. occasionally to call individual patients when necessary.

When a patient arrives at our pharmacy "turn in" window with new prescription forms or empty containers to be refilled, the technician stamps a number in the upper righthand corner of the prescription. The same number is then stamped on the prescription claim check the patient receives, and the numbering machine is advanced one digit in preparation for the next patient. (At the beginning of each day, we reset the numbering machine to zero after recording, for statistical purposes, the number of patients seen the previous day.)

As prescriptions are filled, a technician updates the visual display in the waiting area with the control-panel switches, and sets a hand-operated sign at the dispensing window that also indicates the prescriptions currently available.

When patients come to the window to pick up their prescriptions, we require them to state their names or present a valid identification card, so that their names can be verified with those typed on the prescription labels.

Our patients' reactions to the electronic call system have been overwhelmingly favorable. Whereas we used to have frequent complaints, with our old system, that patients could not hear or understand the numbers announced, we can now constantly display the current number through which prescriptions have been filled.

For our staff, setting selector switches on a control panel is much simpler and faster than making P.A. announcements. We find that the present system virtually eliminates excessive noise, makes it easier to keep track of the number of medications an individual patient

receives, increases processing speed, and cuts down on patient waiting time.

All things considered, we feel that the electronic system provides the best return we ever received on

a \$438 investment.

—Story and photos submitted by LCDR Jerry M. Walker, MSC (chief, Pharmacy Service), LTJG Lee J. Barker, MSC (staff pharmacist), and LTJG Kenneth E. Robinson, MSC (staff pharmacist), NRMC Camp Lejeune, N.C. 28542.

Yokosuka's New Medical Center Under Way

Groundbreaking for the new naval regional medical center at Yokosuka, Japan, took place on 20 May. VADM Willard P. Arentzen, Surgeon General of the Navy, and Japanese construction officials participated in the groundbreaking, which followed Japanese custom, with Shinto priests offering traditional prayers to the Gods for purification of the site and safety during construction. The new center will be adjacent to the existing hospital.

In his congratulatory remarks following the ceremony, VADM Arentzen said the occasion "at once demonstrates continuing progress in medical care and harmony in inter-governmental relations.

"The Naval Hospital, Yokosuka, has had a proud history," he continued. "There have been 55 commanding officers. Thirty-eight were Japanese, and 17 have been Americans. Since its founding in 1880, tremendous changes have occurred, cataclysmic events have transpired—brutal war and peaceful reconciliation. But through it all there has been a constancy of purpose, a dedication and motivation in this institution, which transcends all those upheavals.

"All of the men and women who

have labored in this hospital have shared a common goal, have exhibited a shared humanity," VADM Arentzen said. "Men and nations differ in many ways, but they are alike in so many others. The brotherhood of sickness and pain knows no racial difference, admits no language variation.

"The care of the sick and injured is universal. And in this fine hospital we have embraced that universal, first independently and finally together. For this is now a joint venture. The interactions and interdependence of this staff and the local community are important to each and firmly rooted in time

"This new hospital, just like the old, will minister to the health needs of the sailor and his family. This hospital at Yokosuka in 1980 will not really be so different from the hospital that was first built here in the 13th year of the Meiji Empire. It remains what it was built to be—a place of healing.

"A former Commanding Officer, Dr. Dempsey, put it well: 'The first Commanding Officer and its most recent would understand each other quite well could they find themselves at the bedside of the same sick sailor.'"

'C' School Course for DTs Revamped

At the Naval School of Dental Assisting and Technology, San Diego, the Dental Assistant, Advanced, Class "C" School has recently undergone a change in curriculum to make the training of senior petty officers parallel actual job requirements more closely.

The new curriculum covers both clinical and administrative tasks, and is presented through a modularized form of instruction.

Clinical tasks. Approximately 40% of the curriculum is devoted to the clinical aspect. Modules cover area supervision and assisting in advanced clinical tasks such as appointment desk duties, oral examination, radiology, preventive dentistry, operative dentistry, oral surgery, endodontics, periodontics, prosthodontics, and Central Sterilization Room supervision.

Areas of direct patient care covered include patient-care records, screening examinations, extra-oral radiology, advanced techniques in oral hygiene, advanced assisting skills in support of operative dentistry and other clinical disciplines, and emergency repairs to prosthodontic appliances.

Administrative tasks. The administrative section of the curriculum includes job-related tasks in such areas as instructor training, clinical supervision, logistic support procedures, and clerical procedures. These modules give the trainee the knowledge and skills to function effectively in an administrative capacity in a dental care facility.

Facilities. The Naval School of Dental Assisting and Technology is designed for full support of task-based curriculums and provision of a modern clinical atmosphere.

A laboratory that contains 40 fully equipped dental operatories and a Central Sterilization Room is used for the clinical modules of the curriculum. Supplemental instruction is provided in the facilities of Naval

Regional Dental Center San Diego.

Administrative modules are presented in a classroom supplied with the latest office equipment and a complete library of reference materials. Additional on-the-job instruction is provided in the administrative and logistic sections of the regional dental center.

The Dental Assistant, Advanced, Class "C" School, which is under the direction of a dental officer, in-

cludes among its staff two senior dental technicians who serve as learning facilitators. Classes begin twice a year, with a capacity of 20 students per class.

Applications should be prepared and transmitted to BUMED Code 6111 in accordance with BUMEDINST 1510.13B and TRANSMAN Article 2.02.

—Story by DTC L.G. Glatt, USN. Photos by PH2 Don Hall, USN.



The Naval School of Dental Assisting and Technology occupies one of three buildings in new NRDC San Diego complex.



DT2 R.D. Blount performs a preliminary oral screening examination. School provides a thoroughly modern clinical setting.

Navy Scholarships: What Can They Offer?

With the school year about to begin, it seems a good time to talk about the opportunities open to medical and osteopathic students under the Navy Health Professions Scholarship Program.

Benefits. Students selected for these scholarships receive:

- up to four full years of tuition, including all authorized fees;
- reimbursement for approved books and supplies;
- a stipend of \$400 per month for 10½ months of each year;
- full active-duty pay and allowances, at the ensign pay grade, during 45 days of active duty for training (ACDUTRA) each year;
- a commission as an ensign in the United States Naval Reserve.

Under current legislation, stipends, tuition, fees, and reimbursable materials are nontaxable until 1 January 1983 for students entering the program before 1 January 1979. (Students entering the program on or after the latter date are not protected under current law). ACDUTRA pay is taxable for all students.

Benefits start on the day the student enters the program or the day the academic year begins—whichever is later.

Obligations. Health Professions Scholarship students are required to serve 45 consecutive days on ACDUTRA during each fiscal year (1 October-30 September).

ACDUTRA time can be spent in a school clerkship (required or elective), in a Navy clerkship (clinical or research), in a military indoctrination course, or on an orientation cruise at sea.

Men and women who have held Navy Health Professions Scholarships are obligated to serve two years on active duty for their first two years of participation in the program, or any part thereof, and six months on active duty for each six months of participation thereafter.

Those who will be entering their first period of active service—or will be reentering active service after severing all previous connection with any military service—incurred a minimum active-duty obligation of three years.

Active-duty assignments may be in submarine medicine or aerospace medicine, aboard ships, at naval regional medical centers, at naval hospitals, at dispensaries and clinics, with the Antarctic Research Expedition, or with the Fleet Marine Force.

Graduate medical education. All Health Professions Scholarship students are required to apply for internships in Navy hospitals. Those selected will be ordered to active duty and assigned to their training hospitals with full active-duty pay and allowances.

Scholarship students not selected

for training in a Navy facility may request a delay in active service to complete their internship (without pay from the Navy) in a civilian institution.

Students may also defer their active-duty obligation in order to complete residency training in approved specialties.

The time the scholarship holder spends in a graduate medical education program does not count toward fulfilling the active-duty obligation. However, he or she does not incur any additional service obligation during this period.

Selection. Students in the Health Professions Scholarship Program are selected on a competitive basis. Applicants must have been formally accepted, by a school of medicine or osteopathy in the United States or Puerto Rico, for the next entering class, or be currently enrolled in such a school. They must be citizens of the United States; be of good moral character; and meet the physical requirements for a Navy commission.

Those who are interested in the program and would like details on how to apply should contact their nearest Navy Medical Corps recruiter or write to the Commanding Officer, Naval Health Sciences Education and Training Command (Code 9), National Naval Medical Center, Bethesda, Md. 20014.

Notes & Announcements

In memoriam . . . CAPT John D. DeCoursey, MC, USN (Ret.), a Navy entomologist for almost 30 years, died 20 June 1978, at age 73.

Born in Indianapolis, Ind., CAPT DeCoursey earned his Bachelor of Science degree at Louisiana State University, and his M.S. and M.D. degrees in medical entomology at the University of Illinois. He began his naval career in 1942 during World War II and was assigned as a malaria control officer in the Panama Canal Zone. He later had similar responsibilities on Okinawa. CAPT DeCoursey had duty at the Bureau of Medicine and Surgery from 1945 to 1950, and then spent four years at Camp Lejeune, N.C. From 1954 to 1956, he was stationed in Cairo, Egypt. He then returned to Washington, D.C., until he retired in 1970.

CAPT DeCoursey founded the Military Entomology Information Service, at the Walter Reed Army Medical Center annex in Forest Glen, for which he received a Defense Department commendation. He had a special interest in mosquitoes and was a member of the American Mosquito Control Association.

Dental continuing education courses . . . The following dental continuing education courses will be offered in October and November 1978:

National Naval Dental Center, Bethesda, Md.

Operative Dentistry	2-4 Oct 1978
Oral Surgery	16-18 Oct 1978
Oral Diagnosis and Treatment Planning	30 Oct-1 Nov 1978
Preventive Dentistry and Patient Motivation	13-16 Nov 1978

Eleventh Naval District, San Diego, Calif.

Oral Diagnosis	2-4 Oct 1978
Endodontics	16-18 Oct 1978
Operative Dentistry	6-8 Nov 1978

U.S. Army Institute of Dental Research, Walter Reed Army Medical Center, Washington, D.C.

Endodontics	16-19 Oct 1978
Prosthodontics	6-9 Nov 1978

Armed Forces Institute of Pathology, Walter Reed Army Medical Center, Washington, D.C.

Forensic Dentistry	3-6 Oct 1978
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Requests for courses administered by the Commandant, Eleventh Naval District, should be submitted to: Commandant, Eleventh Naval District (Code 37), San Diego, Calif. 92132. Applications for other dental continuing education courses should be submitted to: Com-

manding Officer, Naval Health Sciences Education and Training Command (Code 5), National Naval Medical Center, Bethesda, Md. 20014. Applications should arrive six weeks before the course begins.

Casualty treatment training available . . . The Navy Dental Corps conducts a continuing program of training in casualty care procedures. The objectives of this program are to provide casualty treatment training to all recently appointed dental officers and to provide a refresher course for career dental officers who took the course five or more years previously. Course dates and locations for Fiscal Year 1979 are:

Naval Regional Dental Center, Great Lakes, Ill. Two 5-day courses will be offered: 23-27 April 1979, 30 April-4 May 1979

Naval Regional Dental Center, San Diego, Calif. Four 4-day courses will be offered: 10-13 Oct 1978; 27 Feb-2 March 1979; 8-11 May 1979; 7-10 Aug 1979

Naval Regional Dental Center, Norfolk, Va. Four 5-day courses will be offered: 22-26 Jan 1979; 5-9 March 1979; 2-6 April 1979; 1-5 Oct 1979

Requests for course quotas should be submitted to the Naval Health Sciences Education and Training Command (Code 5), National Naval Medical Center, Bethesda, Md. 20014, via the Commanding Officer of the course location. Those officers in the immediate area of a course location who do not require travel and per diem expenses may submit applications directly to the appropriate Naval Regional Dental Center in lieu of the Naval Health Sciences Education and Training Command (Code 5).

Continuing education for Navy nurses . . . The Naval Health Sciences Education and Training Command will sponsor the following continuing education courses for Navy nurses:

Physical Assessment of the Adult (22 contact hours)
Corpus Christi, Texas 2-5 Oct 1978

This program will provide the opportunity for Nurse Corps officers to expand their knowledge and skill in history taking and physical examination of the adult through formal class work and practice. The course is planned for nurses assigned to OPD, primary care clinics, emergency rooms, and branch clinics. (Not for certified Nurse practitioners)

Middle Management Conference for Nurses (30 contact hours)
Bethesda, Md. 23-27 Oct 1978

The aim of this conference is to increase the organizational effectiveness of charge nurses entering supervisory roles through the study and application of basic management theory and principles.

Neonatal Intensive Care (18 contact hours)
Bethesda, Md. 13-15 Nov 1978

Emphasis will be placed on therapeutics in respiratory distress syndrome. These modalities will include thermo-regulation, hypoglycemia, nutrition, fluid and electrolytes, and pharmacokinetics, as well as infant resuscitation, stabilization and transportation. A review of prematurity from identification of high-risk pregnancy through the process of maternal-infant bonding will be given, along with social service intervention in relation to the family in crisis with a sick neonate.

The courses are open to Nurse Corps officers not currently assigned to an oversea billet. However, nurses assigned to Argentia, Newfoundland; Bermuda; Guantanamo Bay, Cuba; Keflavik, Iceland; and Roosevelt Roads, Puerto Rico, who have served at least six months on active duty, may apply. The courses are also open on a space-available basis to Nurse Corps officers of the inactive Reserve.

Nurse Corps officers wishing to attend these courses should apply to the Naval Health Sciences Education and Training Command (Code 7), National Naval Medical Center, Bethesda, Md. 20014, following procedures set forth in the BUMED Instruction 4651.1 series. Applications should be submitted four to six weeks before a course begins.

AFIP courses offered . . . The Armed Forces Institute of Pathology will offer the following courses:

Ophthalmic Pathology 25-29 Sept 1978

This course consists of a basic and comprehensive survey of pathologic conditions affecting the eye. The subjects will include a review of the embryology of the eye; a review of general inflammation; acute, chronic and granulomatous lesions and their sequelae; injuries; cataract, glaucoma; vascular diseases; intraocular tumors; optic nerve pathology; epibulbar and orbital inflammatory and neoplastic lesions; and electron microscopy of the normal and pathologic ocular tissues. The material will be presented by lectures and clinicopathologic correlations of interesting cases.

Applicants should be members of the Medical Corps of the Armed Forces or Federal Services who are board qualified or certified or well advanced in pathological anatomy of ophthalmology. Only one Ophthalmic Pathology Course will be given this academic year.

16th Annual Course in Forensic Dentistry 3-6 Oct 1978

The purpose of this course is to acquaint attendees with situations in which they may be of assistance in identification and detection procedures and to familiarize them with current aspects of professional liability. Subject material includes the nature and sources of the law, the recording and use of dental data in human identification and criminal detection procedures, the professional conduct and liability of dentists, the role of the dentist as an expert witness or defendant and legislation affecting the federal dental services. The course will be presented by specialists in the fields of forensic dentistry, criminal investigation and law, through lectures, panel discussions, illustrative situations and student participation in a laboratory exercise involving the identification of human remains by means of the dental record.

Applicants should be federally employed dentists, physicians, lawyers, or law enforcement personnel who have a special interest in this subject.

Applications from qualified civilian personnel will be considered on a space-available basis. Further information may be obtained by writing to the Director, Armed Forces Institute of Pathology, ATTN: AFIP-EDZ, Washington, D.C. 20306.

Dental meeting held . . . The sixth annual meeting of the European Naval Dental Society was hosted by the U.S. Naval Regional Dental Center, Naples, Italy, 27-29 May 1978 at Capri, Italy. The meeting was attended by 21 Navy Dental Corps officers, including the dental Inspector General, RADM J.J. Thomas, DC, USN. The program included a variety of presentations by dental clinical specialists directed toward the continuing education needs of general dental practitioners.

Navy cocktail party at ACS meeting . . . In conjunction with the American College of Surgeons meeting in San Francisco, Calif., there will be a Navy cocktail party held on Wednesday evening, 18 Oct 1978, from 6:30 to 9:30, at the Marines' Memorial Club, 609 Sutter Street, San Francisco. For more information contact: CAPT R.M. Deaner, MC, USN, Chairman, Department of Surgery, Naval Regional Medical Center, Oakland, Calif. 94627.

THE SURGEON GENERAL'S SPECIALTY ADVISORY CONFERENCE WILL BE HELD 12-15 SEPTEMBER 1978 AT THE SHERATON NATIONAL HOTEL, ARLINGTON, VA.

Research in Support of Navy Dentistry

CAPT James F. Kelley, DC, USN

Goals: Better methods of disease prevention; improved treatment; more effective delivery of oral-health care.

During its 66 years of existence, the Navy Dental Corps has developed a proud record of service to the operating forces, thanks to the professional excellence of its dental officers—and the enlisted technicians and Medical Service Corps officers who help them meet their responsibilities.

To maintain this level of excellence, Navy dentists, like other health professionals, depend on the adequacy of the scientific foundation that underlies their clinical activities. The ubiquitous nature of oral and dental disease and the inevitability of trauma are *raisons d'être* for a research program that assures adequate scientific investigation of the problems involved in delivery of dental care.

Dental disease. Destructive dental diseases are among the most prevalent diseases of mankind. They affect virtually all the U.S. population. As a result, the Navy Dental Corps inherits the dental disease ills of the civilian populace, via naval recruits (Figure 1).

The average naval recruit is highly susceptible to acute dental disease that can compromise his or her operational readiness. Data collected at the Naval Dental Research Institute, Great Lakes, Ill., have shown that 98% of recruits have decayed teeth: that the average recruit comes into the service with more than five decayed teeth and develops one to two new lesions per year.

To put it another way, 1,000 recruits will have 5,400 decayed teeth—and 10% of these decay problems will be so severe that an acute dental emergency is imminent (Figure 2). During the Vietnam conflict, in fact, 16% of the Navy and Marine forces in-country had to leave combat assignments for treatment of dental emergencies.

From the Oral and Dental Health Program, Naval Medical Research and Development Command, National Naval Medical Center, Bethesda, Md. 20014.

Acute, painful, debilitating dental disease usually results from the patient's neglect of oral hygiene and failure to seek professional attention. The ravages of this neglect have been well illustrated by the experiences of American POWs returned from Vietnam. The Navy Center for Prisoner of War Studies reported that individuals with a low dental health classification prior to captivity—implying poor oral health habits and avoidance of professional care—fared far worse than those whose oral health had been rated high. At the time of repatriation, 54% of those in the low classification required extractions or root-canal treatment, while just 22% who had been in the highest classification required such care.

The suffering of these afflicted prisoners was clearly reflected in the medical debriefing statement of one individual who had seen, and endured, the sequelae of severe dental disease:

"The dental problem is one of the most severe problems faced by a prisoner of war, because of the psychological effect of prolonged suffering from severe toothache, which manifested itself in despair, anxiety, irritability, and inability to concentrate, even during periods of relief."

Trauma. During periods of armed conflict, care of casualties is the most significant responsibility of the Navy Medical Department.

An estimated 10% to 15% of wartime casualties suffer oral-facial wounds. (During the Vietnam conflict, approximately 38,000 such injuries occurred.) Because the oral-facial region not only comprises a complex milieu of organ systems but also is the focus of personal identity, these injuries have wide-ranging effects. Treatment—which is difficult, prolonged, and costly—must be predicated on methods that are biologically sound and that offer the greatest opportunity for complete rehabilitation, including return to a socially meaningful and productive life.



FIGURE 1. Dental condition of a naval recruit on entrance into service. Both tooth decay and disease of the supporting structures of the teeth are evident.

It is essential that the ability to manage combat casualties continue to be developed in peacetime, to prevent casualty-care deficiencies in the event of any future conflict.

Working in the face of these overwhelming treatment challenges, the Navy Dental Corps annually expends more than 10 million man-hours in carrying out 14.5 million dental procedures. Yet all this effort is not sufficient to meet the need.

Resolving the treatment dilemma is beyond the capability of available resources; therefore, research must lead the way to better methods of disease pre-

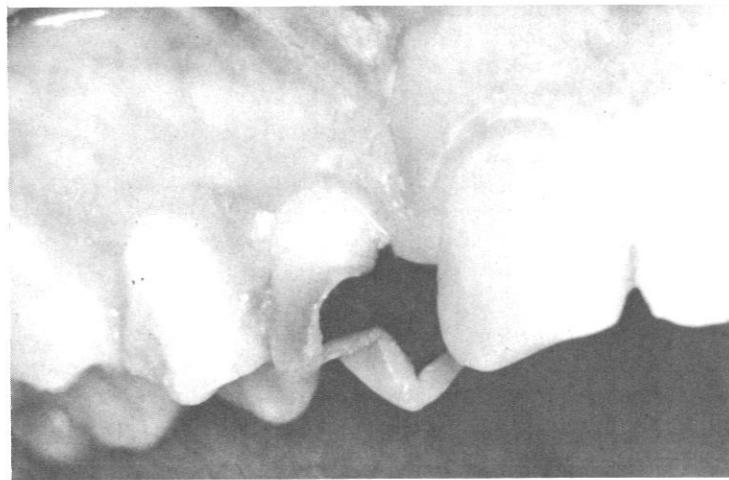


FIGURE 2. Deep decay invading this tooth makes pulp damage likely. A debilitating emergency is imminent.

vention, improved treatment modalities, and a refined system for delivering dental health care.

Biomedical research in the Navy is conducted under the Naval Medical Research and Development Command (NMRDC), an echelon-three organization of the Bureau of Medicine and Surgery. The Oral and Dental Health Program is one of eight research programs within NMRDC and is staffed by 21 officers, 25 enlisted men and women, and 23 civilian employees who work in four different facilities.

The principal laboratory of the program is the *Naval Dental Research Institute (NDRI)* at Great Lakes, officially established as an independent activity on 1 Jan

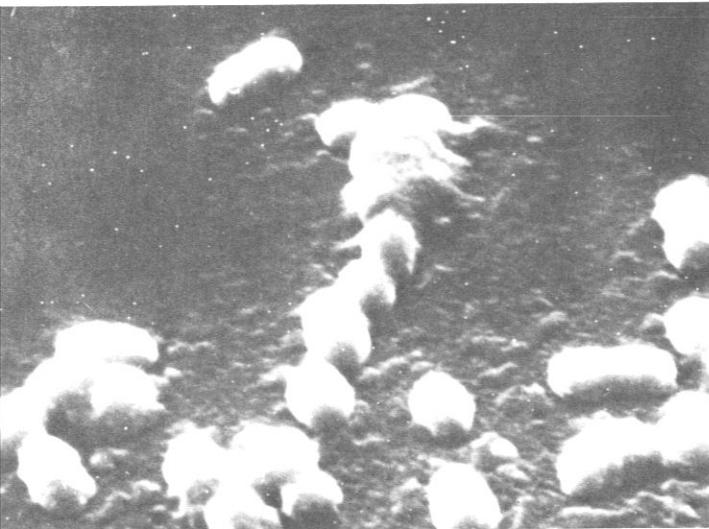


FIGURE 3A. *S. Mutans* on a tooth surface. The organisms secrete glucans, a fuzzy coating that helps them adhere to the tooth.



FIGURE 3B. Tooth surface to which dextranase has been applied. The enzyme preparation has broken up glucans, preventing accumulation of bacteria and dental plaque.

1967. The availability of the recruit population at Great Lakes permits study of disease incidence as well as evaluation of the effectiveness of selected laboratory-developed treatment methods.

Investigations are also conducted within the Dental Sciences Department of the *Naval Medical Research Institute (NMRI)*, Bethesda, Md. Here dental officers have the advantage of working closely with biomedical scientists with widely diversified backgrounds, thus broadening the expertise that can be brought to bear on dental problems.

At the *National Bureau of Standards*, just a few miles from the National Naval Medical Center at Bethesda, dental researchers have a unique opportunity to study the applicability of various materials to operational dentistry.

At the *National Naval Dental Center (NNDC)*, Bethesda, clinical investigation is highlighted. Graduate students in dentistry are given the opportunity to perform research, and thus contribute to the acquisition of knowledge, while at the same time they gain perspective on the value of research to clinical dentistry.

The Navy's oral and dental health research effort has three centers of focus: diagnosis and prevention of oral disease; traumatic injury and surgical problems; and oral health care delivery. Following is a brief description of research initiatives in progress:

- **Tooth decay.** What causes tooth decay? How can it be prevented? In the light of existing treatment responsibilities, these questions must obviously be addressed in order to reduce the operational liabilities attributable to dental disease.

The major bacterial cause of tooth decay (caries) in naval personnel is *Streptococcus mutans* (Figure 3A). These organisms produce a fuzzy coating of glucans (sugar molecules in long chains) that helps them adhere to the tooth and form the substance known to us as dental plaque. Plaque localizes acids and other bacterial products that cause dental disease. One of the problems, then, is to prevent the accumulation of glucans and thus keep *S. mutans* organisms from adhering to the tooth surface.

Figure 3B shows an electron-microscope view of the enamel surface of a human tooth after cleaning and application of a substance called dextranase, which has broken up the glucans and prevented bacterial-plaque accumulation. Agents such as dextranase are being tested by NDRI investigators to determine their effectiveness in preventing decay in the dental-disease-ridden Navy population.

- **Dental-pulp studies.** The "hurt" of toothache comes from irritation of the network of nerves and blood vessels that reside in the dental pulp, or "nerve," of the tooth. Although the pulp is extremely small, it is an essential structure within the tooth and, if severely damaged by decay or trauma, will lose its viability. Once this occurs, the tooth is dead tissue that

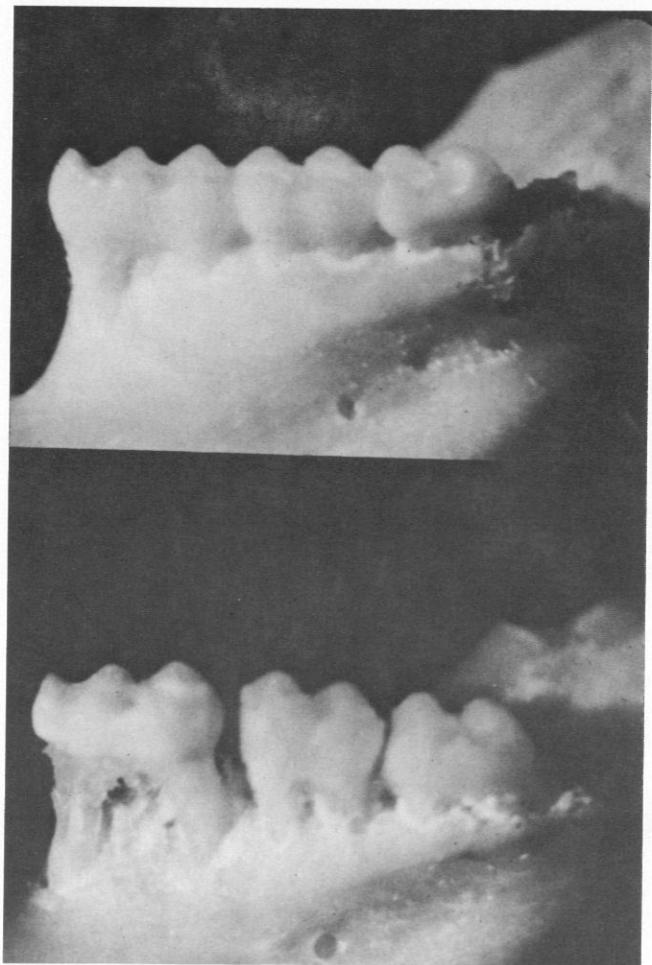


FIGURE 4. Skeletal specimen of rice-rat jaw above shows normal level of bone support to teeth. Specimen below shows severe bone loss in an animal fed a plaque-inducing diet.

will eventually become infected, or "abscessed."

At both NDRI and NMRI, dental investigators are studying the biology of the tooth pulp, in order to better understand its response to disease and trauma and determine its adaptability to various types of treatment.

In one study, tooth substance (dentin) that has been invaded deeply by decay is prepared as an extract, and the bacteria are filtered out. The bacteria-free extracts are then applied to cell cultures and injected into rabbits. Skin reaction indicates the presence of inflammatory response to the decayed material.

The specific components of the diseased-tooth structure that are toxic to tissues will be identified and methods of treatment developed to help the dental pulp survive in the face of deep tooth decay. The results of these studies can contribute significantly to reduction in the number of acute emergencies that continue to plague naval personnel.

- **Supporting-structure disease.** Just as the teeth are subject to destructive processes that develop in the

presence of dental plaque, so also the tissues that support the teeth (periodontium) are adversely affected by this microbial ecosystem (Figure 4). Both the soft tissue (gingiva or gums) and bone (alveolar bone) are damaged by diseases of the periodontium, and in some instances the destruction is rapid and severe. Often, however, the development of disease is insidious and not evident to the patient.

Various types of plaque-preventing agents are being evaluated in the laboratory for possible testing in the Navy population, as a means of preventing damage to the supporting structures of the teeth.

In instances where the supporting structures have been destroyed by trauma or disease, their reconstruction must be attempted, to prevent loss of the teeth and assure satisfactory function. Studies performed at NNDC and NMRI have demonstrated the effectiveness of freeze-dried bone and soft tissue, from the Navy Tissue Bank, for use in reconstructing the supporting structures.

Freeze-dried skin was first investigated in the laboratory and then used successfully in patients to reestablish an attachment of the gingival tissue to the remaining underlying bone and thus prevent further tissue destruction (Figure 5).

When the underlying bone had been destroyed, freeze-dried bone particles were found effective as bone grafts for restoring the defects and assuring adequate tooth support.

• **The dental officer's practice.** How many dentists and dental offices do we need? how many technicians? These questions may seem rather straightforward, but if we are to mount an effective attack on the staggering problems of dental disease, we must determine, as accurately as possible, the circumstances in which dental officers can most effectively treat their patients.

In the past, the usual type of Navy practice involved one dental officer working in one office with one technician. A recent study at NDRI, evaluating various combinations, showed that addition of a second operatory and technician for the dental officer significantly improved the dentist's efficiency and enhanced his sense of professional accomplishment. Realistically, doubling the number of dental operatories cannot be accomplished overnight, and the NDRI investigators are continuing to study various means of improving the practice of both general dentists and dental specialists.

• **Materials of dentistry.** Which type of filling is best for the patient? There's no single answer to this question. In some instances, the silver amalgam filling—or "restoration," as the dental officer calls it—is desirable, while in other instances gold is the material of choice.

The cost of gold has always been of concern, and in these cost-conscious times the Dental Corps is studying the possibility of using various nonprecious metals in lieu of gold, in those instances where gold is professionally indicated.

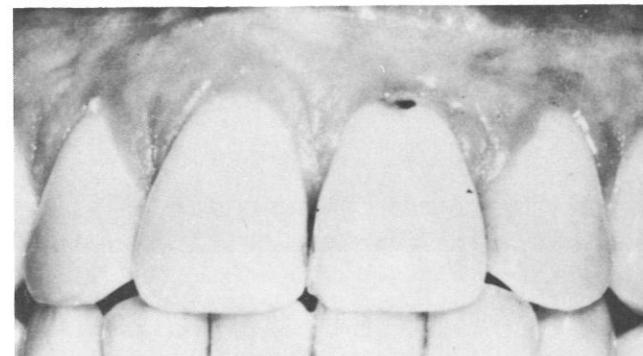
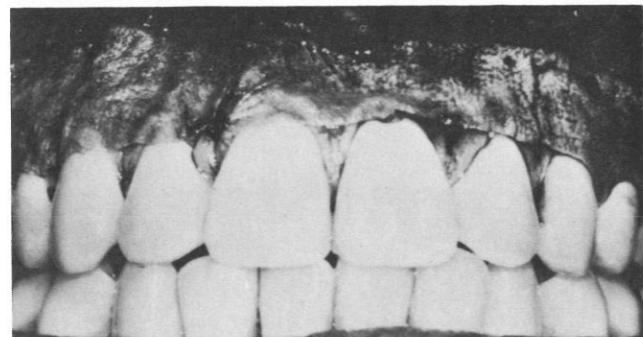
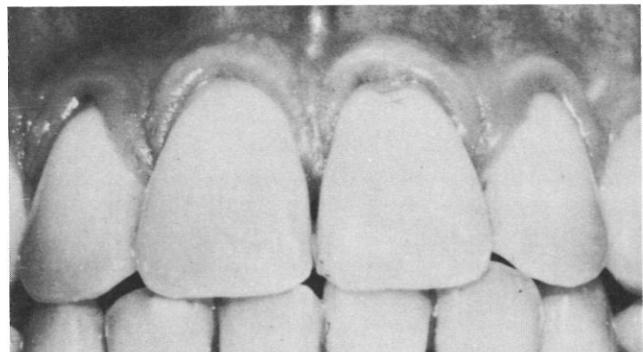


FIGURE 5. Top photograph shows loss of attachment of soft tissue to the incisor teeth. In middle photo, a freeze-dried skin graft has been placed to reestablish integrity of gingival tissue. Bottom: Appearance of skin graft one year later.

The National Bureau of Standards provides an ideal environment in which to study this question. Dental researchers are working collaboratively with scientists at BUSTAN, taking advantage of their expertise and the sophisticated equipment they have at their disposal.

In these studies, tests are being made to determine whether castings made from various nonprecious metals will fit a die (and ultimately a tooth) as well as gold. The ability of the nonprecious metals to bind onto porcelain is also being investigated (a matter of particular importance, because of the need for esthetic porcelain facings on gold restorations in the front of the mouth), as is their ability to be soldered and polished.

• **Treatment of casualties.** "Only the dead have seen

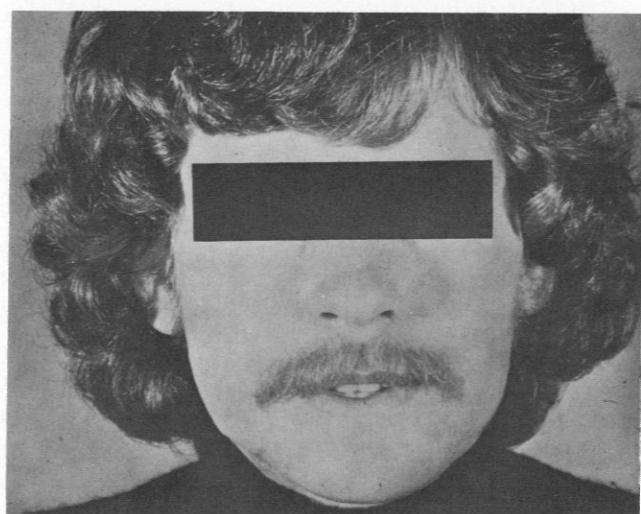


FIGURE 6. Upper left: Vietnam casualty at time of early care following high-velocity missile wound to the oral-facial region. Upper right: Patient, a civilian again, 5 years 2 months after injury. Middle left: Mandible has been reconstructed by series of bone and soft-tissue grafts. Middle right: Lower denture is seated on a stable, reconstructed mandible. Bottom: Panoramic radiograph, 52 months after injury, shows reconstructed mandible.

the last of war," said Plato—an observation that history unfortunately has shown to be all too accurate.

Successful management of complex oral-facial injuries requires a thorough understanding of treatment principles as well as of the logistical environment in which patient care is being provided. Doing the right thing at the right time is essential to a satisfactory outcome when treating patients with injuries of this type.

In an attempt to determine correct treatment principles and the effect of logistics on outcome, investigators at NMRI conducted a long-term study of casualty care. They have summarized the results of their survey of Vietnam casualties in a Navy publication entitled *Management of War Injuries to the Jaws and Related Structures*.* An example of the treatment results reported on in the book is seen in Figure 6.

• **Radioisotopes and bone healing.** Which types of bone graft are most effective for restoring massive loss of bone tissue from the jaws? What are the factors affecting the healing of these grafts?

A major difficulty in responding to these questions has been the lack of an objective means for evaluating the process of bone repair that did not entail the sacrifice of experimental animals. With this in mind, investigators at NMRI developed a method for studying bone repair by employing radionuclide (radioisotope) materials. This method permits the acquisition of objective numerical data, at selected intervals following bone grafting, without the need to sacrifice the animal or surgically invade the graft area.

At selected intervals, radionuclide agents were injected into animals that had received various types of bone grafts to the jaws. The jaws were "imaged" by a camera that detected the radiation given off by the agent, concentrated in the area of the graft. The extent of healing in the graft area could then be visualized from the resulting images. A method of accurately identifying specific areas within the grafted bone in the images was devised, thus permitting the acquisition of numerical counts that reflected the extent of healing (Figure 7).

This unique method has permitted better assessment of various types of bone grafts for oral-facial reconstruction. It continues to be used at NMRI to assess the significance of such factors as the effect of oxygen delivery on the rate and quality of bone-graft repair.

• **Chronic wound infection.** Chronic jaw infection is a problem that greatly increases the complexity and duration of casualty care. At NMRI, an animal model has been developed to study the effects of high-pressure oxygen on resolution of such infections, the rationale being that the diseased bone is deficient in oxygen supply and therefore refractory to treatment.

In this study, animals were placed in a high-pressure chamber with a 100% oxygen atmosphere for two hours

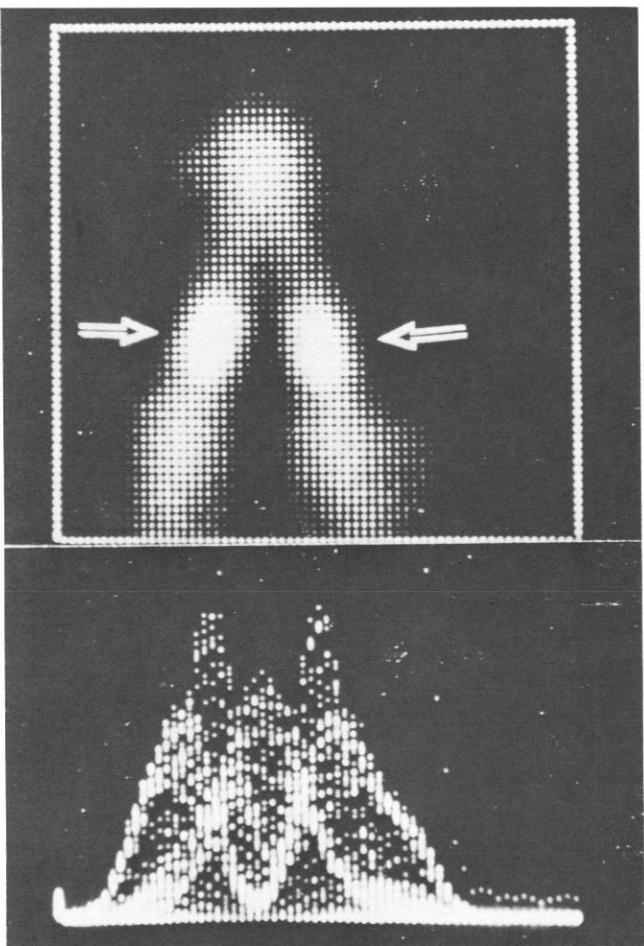


FIGURE 7. Image and image profile, resulting from injection of radionuclide materials, reflect extent of healing in bone grafts (arrows).

each day, for a period of 40 days. In the preliminary stages of the study, investigators found that bacteria introduced into experimental wounds in these animals to produce infection could not be cultured from the wounds after the 40-day period of treatment. The gross clinical appearance of the wounds in these animals, treated with high-pressure oxygen, was much improved, compared with wounds in a group of control animals that did not receive the oxygen therapy.

Combating the ravages of oral and dental disease and assuring appropriate treatment for victims of trauma are the primary reasons for a program of research in support of the Navy Dental Corps and its objectives. The dedicated scientists who work in that program are expending their efforts to assure that Navy dentistry keeps pace and maintains a contemporary posture in a world where moon-walking has been a reality and where the half-life of biomedical scientific knowledge is but a brief decade.

*Available for \$12 from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.



Fleet liaison duties are among assignments of MSC personnel.

A Charge to the Medical Service Corps

CAPT Paul D. Nelson, MSC, USN

On 1 June 1978, in my first official function as the seventh Chief of the Medical Service Corps, it was my privilege to deliver the class charge to this year's graduates of the Naval School of Health Sciences Program in Health Care Administration. Within the past month, once more I had the honor of meeting informally with—and addressing more formally, on the occasion of their graduation—55 of our newly appointed Medical Service Corps officers completing their orientation training in Bethesda.

These two graduating classes of officers are important to me for several reasons. To be sure, they offered me the occasion for some of the more pleasant ceremonial duties of the Chief of the Corps. But perhaps more importantly, they represent a microcosm of the Medical



CAPT Nelson, new MSC Chief

Service Corps, diverse in their backgrounds and sources of procurement, but united in their purpose.

Some had previous enlisted experience as hospital corpsmen and dental technicians; a few had served in the past as commissioned officers of the line. Still others had no previous military experience at all. Their educational backgrounds ranged from those just short of a baccalaureate (though closing in on that mark) to the doctorate level of training in various allied health and science professions. Men and women were among their ranks, as were officers diverse in ethnic and other cultural characteristics of our national population.

The second attribute of these graduating classes which strikes me as not only important but exciting was their sense of enthusiasm and

commitment to the challenges they foresee in their roles as Medical Service Corps officers. Despite their heterogeneity in background and profession, they were in common bright, poised, earnest, and ready to perform, as well as to learn. These officers, from all sections of our Corps, represent the hope of our future.

I cite these two classes because of what they symbolize. I might also have mentioned those Medical Service Corps officers recently graduated, and with honors, from the U.S. Army/Baylor University Program in Health Care Administration, or the numerous officers completing graduate work in medical allied science fields and Health Care Administration related programs at universities throughout the country. For they too represent the base of our officer corps for the future. Without a doubt, we have today the best educated officers in the history of the Medical Service Corps. For that reason, and because of the enthusiasm of our younger officers, I am optimistic about our future.

Indeed, it is the future on which I wish us to reflect—and it is the spirit of a “charge,” more than a “state-of-the-Corps” letter, that I feel most appropriate in this issue of *U.S. Navy Medicine*, in which we commemorate the 31st anniversary of the Medical Service Corps.

Professor Daniel Levinson of the Yale University School of Medicine, Department of Psychiatry, recently authored a book which he and his colleagues entitled *The Seasons of a Man's Life*. In his work to formulate a theoretical basis for the various phases and transition periods of adult life, Levinson's metaphorical theme seems strikingly applicable to the life of the Medical Service Corps as well. For we find ourselves in the first year of what Levinson calls “the age thirty transition,” a period during which there is “an opportunity to work on the flaws in the life structure formed during the previous period, and to create the basis for a more satisfactory struc-

ture that will be built in the following period.”¹ That, indeed, is the task that presently faces us as a Corps of the Navy Medical Department.

With each retirement, another element of the early Medical Service Corps life slips away. The valuable experiences of those officers remain only in what was transmitted down. But the “conventional wisdom” of the past may not be sufficient for the future.

New problems are faced by the Navy Medical Department each day that cry out for new ideas, new technologies, and new forms of organization as well. These requirements for creativity—tempered, to be sure, by the practicalities of resources and the validity, in many instances, of professional practices that have withstood the “test of time”—are everywhere apparent in demands placed upon our Medical Department in its mission to support the active duty forces and other health care beneficiaries. The role of education has never been greater, but the need for firsthand experience is just as great. The Medical Service Corps officer, as a vital member of the Medical Department team, faces in all of this unprecedented professional challenges.

What are some of those challenges? What are some of the new directions in which we must move? I have asked a sample of Medical Service Corps officers for their thoughts on these matters. Though few in number, the officers sampled represent the wide array of professional specialties, past military experience, and duty assignments that characterize the Medical Service Corps. Here are some of their thoughts:

- It is clear that the mission, goals, and objectives of the Medical Department are being redefined for pursuit with increased vigor. Man-

power and fiscal resources will be realigned with the various specialties needed for tomorrow's Medical Department mission, by program rather than entity.

- It is likely that the Medical Service Corps could provide increased service by both providing and managing support functions that are not physician-intensive.

- The environment in which we MSC officers find ourselves today, compared with that of those who preceded us, is vexatiously complex and technically oriented. To a much greater degree today than in the years past, health care legislation and numerous other public laws impact directly on what our jobs are in the military, and how we do them. This situation requires a new breed of MSC officer—a breed highly and specially trained in the new disciplines of modern management theory, management control, and the dynamics of legislative health care.

- The ever-increasing inflationary spiral, coupled with continued resource constraints imposed by Congress, challenges us to be innovative. We must develop methods to increase productivity, improve the quality of services, motivate personnel to perform at optimum levels, and at the same time control cost escalation.

- Perhaps we can take a cue from the recent Operational Medicine Training Workshop. The proposals most frequently made concerning medical officers were: active recruiting for operational tours, early career operational tours prior to advanced education above the GME-1 level, and operational tours upon completion of advanced-level education. We also have a genuine need for a continuous input of highly qualified Medical Service Corps medical planners and administrators in both the Fleet and the Fleet Marine Force.

- The health care field is ever changing. Not only advances in technology, but the changing requirements throughout, dictate that we remain alert to these changes. It behooves each of us to plan for self-

¹Levinson DJ, Darrow CN, Klein EB, Levinson MH, McKee B: *The Seasons of a Man's Life*. New York: Alfred A. Knopf, Inc, 1978, p 84.

development. Project your future as you view it; determine objectives; establish realistic, attainable goals—and then develop a program that will enable you to achieve them.

- The current trend to balance our Corps with equal numbers from direct procurement and inservice procurement should enhance our effectiveness. Young, formally trained health care administrators bring to our Corps progressive, innovative ideas essential to the health care industry. They complement those members of our Corps who are selected from the enlisted ranks of hospital corpsmen and dental technicians. These individuals, former enlisted members, have the distinct advantage of experience in the "Navy way" of doing things. They are seasoned, experienced professionals who offer a valuable contribution to the Corps. Each group has the potential of mutual assistance, one to the other.

- In my view there is one major problem confronting the Medical Service Corps today, particularly the Allied Science Section. That is the lack of, or insufficient potential for, increasing responsibilities as our individual officers progress in grade or experience. There is a need to increase management skills of allied science Medical Service Corps officers.

- The Medical Service Corps HCA section has a billet structure that resembles a sawed-off pyramid. While we have an overwhelming number of billets at the middle-management level, there are too few opportunities in higher-level management positions for those individuals who have demonstrated management talent.

- It is incumbent upon the Medical Department to identify those positions within senior management that require professional expertise as well as administrative ability. Many of these positions could be filled equally well by qualified individuals, regardless of their Corps subspecialty. Every effort should be made to select those individuals



One Corps, many specialties. Among them: environmental health . . .

most qualified to perform these jobs.

- Billets for Medical Service Corps officers with the Marine Corps have increased over the past few years, not only in numbers, but in levels of responsibility. Within the active Fleet Marine Force, there are 21 command billets in medical companies, hospital companies, medical logistics companies, and medical battalions. The medical companies offer the unique opportunity for young officers at the lieutenant/lieutenant (jg) levels to experience the responsibilities of command. These billets can and should serve as an initial training ground for the development of future commanders of larger Fleet Marine Force or Navy medical units. Command of an entire medical battalion—with its 540 beds, 16 surgeries, ancillary medical services, communications, motor transport, supply, food service, graves registration, and administration—provides the more senior officer the full gamut of command responsibilities found in any major line or staff community.

- "There are many members, but one body." I use this quotation from the Bible, 1 Cor. 12:20, to il-

lustrate how I view the Navy Medical Service Corps—there are many specialties, but one Corps. These many specialties are the strengths and the weaknesses, as I see them, in the Medical Service Corps.

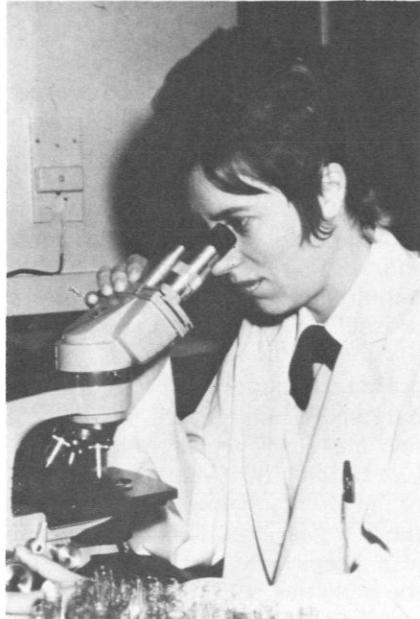
There are 21 specialties in six sections in the MSC. These specialties give our Corps great diversity and provide the Navy Medical Department with a broad expanse of expertise in many professional occupations. This is definitely a strength. So why is diversity a weakness?

Let's look at one area—career patterns and progressions. Due to the nature of some of our specialties and the number of billets within the specialty, there are no definite career patterns, and the opportunity for progressing to more meaningful and responsible positions is extremely limited.

I prefer not to be negative about the Medical Service Corps because I think there are many bright spots. I think the quality of the new people coming into the MSC is tops in all the specialties. There are more management opportunities because of the shortage of physicians. Recently a number of staff billets for



... aviation physiology



... medical technology

MSCs have been made available in Line commands. These are all good things that are happening to our Corps.

• I envision the Medical Service Corps continuing to play a vital role in our Navy's health care delivery system. The emphasis remains on "TEAM" work—in the Medical Department, in the Navy, and in the Marine Corps. I would urge each officer to review his or her responsibility in this endeavor.

To address those challenges, we must work together, not only as members of one Corps of officers, across different professional specialties, but together, as one Medical Department, across our different Corps as well. We must be naval officers first! For that is our profession, too.

We must in the year ahead closely examine the various roles in which we currently function, and identify, as well, those in which our services are required but not presently offered. We must realign as necessary the structure of our billets with the requirements that are identified under current operations, as well as for various contingencies of support required by the operating forces, Navy and Marine Corps alike.

We must work closely with other members of the Medical Department in developing these staffing concepts and plans, as we must also do in our review and development of new opportunities in training and continuous education. Another article in this issue addresses some of those training opportunities, which require closer linkage to billet requirements than in the past.

We must put greater emphasis on career patterns and alternative ca-

reer path options, such as to increase the sense of professional challenge and responsibility for officers in all sections of our Corps—and also to achieve greater flexibility in the assignment potential of our officers, without sacrifice of quality in their professional development or performance. This is not to say that there will be one mold for all officers; on the contrary, the goal is to achieve better planning while at the same time allowing for more diversity in careers. This will not be easy to achieve, but must receive our full attention.

To begin working in these directions, I plan to reorganize the Corps directorate this fall. I am bringing onto my staff two senior officers—CAPT Ann Hatten and CAPT-selectee Vic Swindall—to serve as Deputy for Allied Health and Science Professions and Deputy for Health Care Administration and Management Professions, respectively. (Of our total Corps strength, approximately 1,800 officers, about half are in each of those general professional areas.) Through their able leadership, I hope to expand the present base of professional specialty consultants and, indeed, the base of participation among all officers of the Medical Service Corps, junior and senior, hospital and fleet, research and health care.

We will want your ideas; we will need your help. We will expect your commitment to the challenges ahead, if we are to get the job done as others have in the past. I know we can count on each of you in that endeavor, and I thank you, each one, for your support as we move together—many talents, one team, one spirit.

That is my charge.
Happy Birthday!

On behalf of the Medical Service Corps officers of the U.S. Navy, it gives me great pleasure as well to extend a Happy Birthday greeting to our Navy Medical Department colleagues of the Dental Corps who share our anniversary month of August.

Training Programs for MSC Officers

Educational programs available to Medical Service Corps officers include full-time training, part-time training, and continuing education. All Medical Service Corps officers are encouraged to become familiar with these programs and participate in them to the fullest extent possible.

Full-time training. In addition to training in civilian institutions at the undergraduate, graduate, and doctoral level, other programs include: the Blood Bank fellowship at Walter Reed Army Medical Center; pharmacy residency programs at the National Naval Medical Center, Bethesda, Md., and at NRMC San Diego; the podiatry residency at Naval Hospital Beaufort, S.C., and the U.S. Army/Baylor University Program in Health Care Administration at Fort Sam Houston, Tex.

Also available are the Health Care Administration Course, the Financial and Supply Management Training Program, and the Patient Services Training Program at the Naval School of Health Sciences, Bethesda; the Naval Postgraduate School, Monterey, Calif. (curricula primarily in finance, personnel management, and automatic data processing); and various service schools such as the Armed Forces Staff College, the Industrial College of the Armed Forces, and others.

Application procedures are outlined in BUMEDINST 1520.12G. Applications for all full-time training, except for those programs indicated below, must be submitted to the Commanding Officer, Naval Health Sciences Education and Training Command (HSETC), no later than 15 October of each year.

Requests for programs at the Naval War College, Armed Forces Staff College, Marine Corps Development and Education Command, Industrial College of the Armed Forces, and Field Medical Service School should be sent directly to the

Chief, BUMED (Code 71), since assignment to these programs usually requires post-training assignment to specifically identified billets.

It is recommended that requests include the *exact* start and completion dates of the training requested, all transcripts and *test scores* (required for consideration for the USA/Baylor program). Since a letter of acceptance is not always obtainable in time to meet the above deadline, a statement from the institution, indicating that the applicant has taken some action to gain admission, will suffice. An alternative course of action would be to apply to an institution a year in advance and then defer the acceptance until approved by the Medical Service Corps Training Board for the following year.

Selection to full-time training is based upon several factors. First and foremost are the projected staffing needs of the Medical Service Corps.

The second factor is availability of the applicants. It is Navy policy that projected rotation dates be strictly adhered to. An officer should not expect to have a tour of duty prematurely curtailed so that he may enter full-time training.

Part-time training. The Part-Time Outservice Training Program gives Medical Service Corps officers an alternative to full-time training as a means of raising their educational level. While many of the participating officers are working on their bachelor's degrees, an increasing number are working for master's degrees and doctorates.

The part-time training program also permits those officers interested in full-time training to begin advance work on their degrees prior to selection for full-time training. This reduces both the financial and time-to-degree-attainment support needed, and in some cases en-

hances the applicant's request for full-time training support.

The part-time training program provides partial sponsorship to officers taking evening or weekend courses in accredited civilian institutions. Courses requested must be in an area directly related to areas of Medical Department responsibility and associated with a degree-attainment program. The degree should be in one of the physical, chemical, clinical, biological, or socio-psychological sciences or fields associated with Medical Department administration.

Officers participating in this program must agree to remain on active duty for two years following completion of the approved course. BUMEDINST 1500.7D is the applicable instruction for this program.

Continuing education. With rapid changes in the technology, administration, and delivery of health care, and with greater emphasis on accountability, continuing education is essential for maintaining professional competence.

Participation in professional-update short courses and seminars is one means by which Medical Service Corps officers can keep abreast of the latest advances and events in their professions. This participation also keeps MSC officers aware of the activities and problems of their counterparts in the civilian sector.

Guidelines and procedures for participation in continuing education programs are contained in BUMEDINST 4651.1B.

Contact for further details. LT Jeffrey A. Kramer, MSC, USN, Director, Medical Service Corps Programs, is available to assist with problems or questions that may arise. He can be contacted at the Naval Health Sciences Education and Training Command (Code 6), National Naval Medical Center, Bethesda, Md. 20014; Autovon 295-0625, Commercial (202) 295-0625.

NAV MED Newsmakers



LT Pope: élan

Photo by John Bacheller

Some people may think of psychiatric nursing as depressing, but not LT Carolyn Pope (NC), a charge nurse in the psychiatric department at NRMC Portsmouth, Va.

For most of her eight years in nursing, she's worked with psychiatric patients and in drug rehabilitation. "It's work I enjoy," she says. "I can see the progress the patients are making."

Asked if, as a Black, she's encountered prejudice in the Navy, she answers with a candid yes. "At first it really caused me to have cultural shock. Then I realized that people are people, in uniform or out of uniform. . . .

"I've been very fortunate in having a nursing director and assistant director whom I can really talk with. I've found that some problems are because I'm Black and others are just because I'm me, a female who's sometimes very out-

spoken and likes to move . . . get things done," she says with a grin.

LT Pope is a woman who handles her life with élan. And through her profession, she's hard at work helping others learn to do likewise.

LCDR Oloff L. Hansen (DC) has good reason to smile, having been awarded the Navy Achievement Medal for his performance while serving as dental officer of Marine



LCDR Hansen: initiative

Aircraft Group 24, 1st Marine Brigade, in Hawaii.

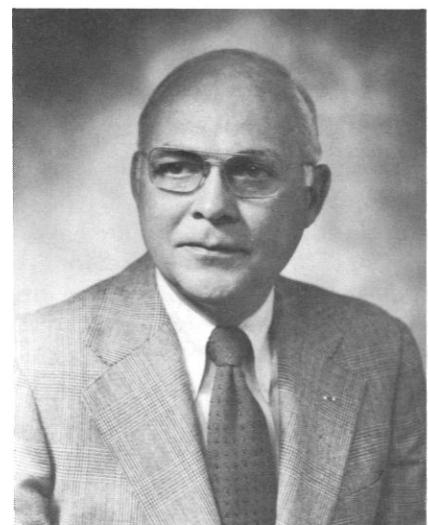
Throughout that assignment, says his citation, Dr. Hansen "consistently performed his demanding duties in an exemplary and highly professional manner. Displaying exceptional initiative and resourcefulness, he continually provided outstanding dental service, and was instrumental in obtaining and implementing the use of a mobile dental van. . . . His program resulted in saving untold man-hours by having dental service available in

the immediate vicinity of each squadron."

Dr. Hansen is currently assigned to the Marine Air Station at El Toro, Calif.

CAPT Clarence J. Gibbs, Jr. (MSC, USNR-R), a distinguished microbiologist known for his work with slow viruses, has been named to represent the Navy Medical Department's Reserve component on the executive council of the Association of Military Surgeons of the United States. He is responsible for developing the first Naval Reserve medical program for the annual AMSUS meeting, to be held later this year.

Dr. Gibbs is deputy chief of the Laboratory of Central Nervous System Studies, National Institute of Neurological and Communicative



CAPT Gibbs: more honors

Disorders and Stroke. Within the past year, he was awarded an honorary doctorate in medicine from the Faculté de Medicine, University of Marseille, France—believed to be the only honorary medical degree to be held by a Navy MSC member.

Empire Glacier '78

Medical aspects of a cold-weather exercise

CDR Robert D. Chaney, MC, USN

Early this year, LT Bill Boggs (MSC) and I joined units of the 1st Battalion, 6th Marine Regiment, for Empire Glacier '78, a cold-weather training exercise at Fort Drum, N.Y.

During the period of the exercise (9 January through 2 February), we spent a number of days living in the field with units from the battalion landing team, in order to experience firsthand the stresses inflicted on the Marine exposed to cold. Weather conditions ranged from deep, dry, cold to moderate, wet cold, with temperatures from -17°F to 40°F.

After we had been taught how to build temporary field shelters, we and our Marine friends set out on snowshoes, with a full field pack, for our first overnight stay in the snow. Despite our natural apprehensions, we all quickly learned that we could survive in this hostile environment with a minimum of discomfort. After this first experience with makeshift shelters, arctic tents and Yukon or squad stoves were provided, so subsequent life in the field was relatively cozy.

Before their departure from Camp Lejeune, N.C., the Marines had been thoroughly briefed on survival in the field, with emphasis on good cold-weather preventive-medicine measures, such as wearing appropriate clothing, changing socks frequently, and using the vapor-barrier "Mickey Mouse" boots. The troops were also warned

CDR Chaney is a member of the Department of Experimental Medicine/Anesthesiology at the Naval Medical Research Institute, Bethesda, Md. 20014.

about overheating during exertion in cold weather, leading to hypothermia during rest, and about the hazards of dehydration, constipation, etc.

On our arrival at Fort Drum, LT Boggs and I set out to reinforce these instructions with many small briefings that included such guidelines as, "Every time you eat, change your socks—more frequently if needed." These briefings were aimed primarily at preventing frostbite and maceration of the tissues.

Frostbite occurs when the feet become increasingly cold, until tissue actually freezes. Vapor-barrier boots can keep the feet relatively warm as long as the wearer is active. However, when vigorous exercise is followed by a period of inactivity, during which the feet cool off, these boots will, in fact, keep the feet cold. Moreover, perspiration accumulating in the vapor-barrier boots, when they are worn indoors or in temperatures warmer than those for which the boot was developed, will result in softening and maceration of the tissues.

All these problems can be prevented by frequent sock changes, preceded by carefully drying the feet and toes, then dusting them with an absorbent powder. (Recently, solutions of 50% aluminum chloride in alcohol have been recommended to prevent foot sweating.)

Proper foot care was given great emphasis by the battalion commander, who was quite knowledgeable about cold-weather medical problems. Squad leaders conducted nightly foot inspections in the field,

and questionable injuries were reported to the corpsmen, who in turn reported them to us. The squad leaders and corpsmen quickly became expert in recognizing early signs of cold injury.

We were fortunate in having the full cooperation of the battalion commander, so that daily briefings to the company commanders included our input on anticipated problems from the medical standpoint—e.g., dehydration during the upcoming exercise, overheating, and the possibility of constipation as a result of three days of "C" rations, inadequate fluid intake, and natural reluctance to defecate in the cold, snowy outdoors. Careful observation of the "snow flowers," in fact, provided a fairly accurate indication of the state of hydration.

Our second sojourn in the field lasted five days, during which LT Boggs and I made frequent checks of the various companies through the company corpsmen. This not only gave the corpsmen an opportunity for consultation in the field but also served to relieve anxieties among the Marines, who quickly learned that at no time were they far from medical help and evacuation, should either become necessary.

This was pointed out rather dramatically during the first few nights. Several Marines with very cold feet ("frotnip") were discovered, sent to the battalion aid station (BAS), rewarmed completely, then returned to the bivouac

Nothing's easy when the temperature is low and the wind-chill factor is high.





Arrival at bivouac site—temperature -5°F.

area. This had several good effects. The individuals in question found that they could and would be evacuated to the rear if medical necessity demanded it. They also learned that their injuries were reversible and could be adequately treated at the BAS level. At the same time, they learned that having cold feet alone did not relieve a man of his temporary obligation to live and sleep in the field.

Throughout the exercise, the U.S. Army provided backup medical facilities at the cantonment area for the 15,000 Army, Air Force, and Marine personnel involved. A MUST (medical unit, self-contained, transportable) hospital with surgical capabilities was erected to handle the more serious injuries. (No surgery was performed on Marine personnel.) Prior to establishment of the MUST, a fractured ankle was treated at the civilian hospital in Watertown and the patient was returned to Fort Drum on crutches.

During the mock war the troops were engaged in, a forward BAS

was established in the field to determine the need for casualty evacuation to the cantonment BAS 52 miles away.

I am happy to say that the time spent in preventive medicine at all levels was not wasted. There were, of course, exceptions. In a few cases, persons "too busy" to comply soon found that what had been told them was quite true. For example, one man who had joined the outfit just days prior to departure, and who said he "wasn't told you had to change your socks more than once a day," presented with gross maceration of superficial skin overlying the tarsal-metatarsal area. He was returned to the cantonment area for definitive therapy, consisting of bedrest and open technique for the care of the seeping areas.

Another man, having been issued two "inner" sleeping bags, elected to take only one to the field. After breaking the zipper during the night, he slept partially exposed and was brought to the BAS in an ahkio sled, with very early frostbite of both fingers and toes, manifested

by edema without blister formation. He had a rectal temperature of 35°C. He was evacuated to the rear and responded to warm-water thawing of the affected digits. His mild hypothermia was treated by bundling him into two sleeping bags in a heated ambulance en route to the cantonment area BAS.

In all, seven persons with early frostbite were evacuated to the rear. All responded well to warm-water therapy. No case of frostbite or hypothermia required hospitalization beyond the BAS level.

Several "flu" syndrome cases were diagnosed in the field and quickly evacuated to the rear BAS to prevent further spread of the disease in the confinement of the arctic tents.

As might be expected, the greatest number of maladies involved the upper respiratory tract. Men with these illnesses were treated at the BAS in the field and were usually returned to duty. One man with bronchitis and one with pneumonitis required "sick in quarters" for 3-4 days. Both responded well to ther-

apy and were returned to duty.

During most of the field exercises, the troops skied or snowshoed into the bivouac area. During the "war," they were conveyed to the area by truck or helicopter and continued on "foot." Several minor injuries occurred among men learning to ski, the most serious of these being a fractured ankle. One man was evacuated to Camp Lejeune because of deep thigh lacerations sustained in a fall on a piece of equipment. And one Marine required the services of an ophthalmologist for eye injuries sustained when a tin of "C" ration peanut butter exploded on a stove. This was the only Marine who needed to be referred to the MUST hospital.

One potentially serious accident occurred, but without serious sequelae, thanks to the repeated medical briefings. While crossing a stream, a Marine fell through the ice and was immersed in water up to his waist. Corpsmen and fellow Marines immediately removed his wet clothing, wrapped him in a sleeping bag, and air-evacuated him to the BAS in the rear, where he was treated and released before word of the event reached us.

A potential medical catastrophe was averted by cool heads and compliance with instruction. While we were in the field on the march, after several days of near-zero weather, we were hit by 36 hours of continuous rain, followed by a quick freeze. Using the warming methods available, everyone succeeded in drying his gear, so that despite the potential for multiple cold-weather injuries, only a few mild hypothermia cases resulted.

A word about evacuation: Casualties could be taken by ahkio sled, via the field BAS, to the nearest paved road or could be air-evacuated by helicopter. As it turned out, however, helicopter evacuation was used only to transport the immersion victim to the rear, while the remaining evacuations were carried out by ambulances stationed at the forward BAS.

LVTs (landing vehicle, tracked)—



Pine boughs, string, and poncho make a shelter.



Unloading supplies is one way to keep warm.

the only vehicles capable of moving over extremely deep, wet snow—stood by for evacuations in case the weather put a stop to flying. However, except for an occasional "frotnip" case, evacuated in the normal course of returning an LVT to base, this method was not used. Nevertheless, to those of us charged with the medical care of 2,000 Marines, it was very comforting to know that such a foolproof evacuation vehicle existed.

To summarize: In a four-week period a battalion-sized Marine unit

became acclimated to an entirely hostile, foreign environment and found it could not only exist but could also conduct offensive and defensive maneuvers with relative ease and with only minor, transient casualties. But without proper information, lectures, and repeated preventive medical briefings at all levels, by interested, qualified medical and paramedical personnel cognizant of cold-weather medical problems, serious injuries—and possibly death—could have occurred.

Incidence of Nonorganic Hearing Loss at a Military Hospital

David H. Dedman CDR J.R. Phelan, MC, USNR

Nonorganic hearing loss, whether it is voluntary (malingering) or involuntary (psychogenic), occurs more frequently in the military than in the civilian population. There are many opportunities in the military to gain from an alleged hearing loss. A chance for monetary compensation, relief from unwanted duty, and discharge from the service are only a few reasons why exaggeration of a hearing loss may be tempting to military personnel.

Nonorganic hearing loss has been prevalent in Veterans Administration and military hospitals for more than 30 years (1,2,3,4). Examiners' awareness of the frequency of this problem—and the many audiometric tests available to detect it—combine to allow very few of these cases to go undetected in the VA and military setting. This high rate of detection of the problem, however, does not seem to discourage its incidence.

Nonorganic hearing loss was first recognized, and its importance to the Federal Government first noted, in the Armed Forces aural rehabilitation programs during and after World War II (1). The magnitude of this problem for the government is evident in the veteran population alone. It has been estimated that from 11% to 45% of veterans with a service-connected hearing loss demonstrate a nonorganic hearing loss or overlay in their hearing thresholds (2). Since the federal government may award various types of compensation for service-connected hearing impairment, exaggerated hearing loss can be costly.

The data presented in this study were collected at the Otolaryngology Clinic at NRMC Great Lakes, Ill., over an 18-month period (June 1976 to December 1977). The subjects have been separated into three groups: re-

TABLE 1. Incidence of Nonorganic Hearing Loss in Subject Groups

Subjects	Number	Nonorganic Hearing Loss
Recruits	512	382 (74.6%)
Retired/active duty	1,404	229 (16.3%)
Dependents	1,025	127 (12.4%)
TOTAL	2,941	738 (25.1%)

cruits, retired and active-duty personnel, and dependents of retired and active-duty personnel. This grouping provides some idea of the incidence of nonorganic hearing loss in various populations.

Method

Our audiometric criteria for nonorganic hearing loss consisted of failure on three or more of the following audiometric procedures: pure tone and speech audiometric correlation, electrodermal audiometry (EDA), presence of the stapedial reflex, the Stenger test, Bekesy audiometry (Type V), the diversion of auditory task test (DAT), and a speech discrimination test below alleged thresholds of hearing. Usually a discrepancy between pure tone and speech reception thresholds, not explainable by the configuration of the audiogram, is one of the first indications of a nonorganic hearing loss or overlay to the examiner.

The subjects evaluated in this study were 2,941 individuals referred to our clinic because of an apparent hearing problem. The subjects were not randomly sampled, but rather were individuals complaining of a

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hearing disorder. The incidence of nonorganic hearing loss in such a group is significant to clinics and hospitals that see referred patients. In this type of subject, this incidence is higher than in a random sample of individuals, since the majority of nonorganic hearing loss cases involve exaggeration of an existing hearing difficulty (2,5,6).

Results

Nonorganic hearing loss was identified in 738 (25.1%) of the 2,941 subjects evaluated (Table 1). This percentage was greatly inflated by the high incidence of nonorganic hearing loss in the recruit population. Disregarding the recruit group and considering only the 2,429 retired, active-duty, and dependent subjects, nonorganic hearing loss was identified in 356 (14.7%).

• **Recruit population.** The subjects evaluated in this study included 512 U.S. Navy recruits, ranging in age from 17.2 to 21.3, with a mean age of 18.2 and a median age of 18.7. Three hundred and eighty-two (74.6%) of these recruits demonstrated some exaggeration of hearing loss in one or both ears (Table 1). A majority (56.4%) demonstrated a bilateral nonorganic hearing loss. Twenty-four (6.1%) of the 382 individuals in the nonorganic group had bilateral normal hearing. Twenty (83.3%) of these 24 had an alleged unilateral hearing loss.

• **Retired and active-duty personnel.** Also included in our study were 1,404 retired and active-duty personnel from all the Armed Forces, ranging in age from 17.8 to 78.6, with a mean age of 42.3 and a median age of 38.5. In this group, 229 individuals (16.3%) had non-

organic hearing loss or overlay in one or both ears (Table 1). The majority of nonorganic hearing impairments in this group also were bilateral: 146 (63.6%) of the 229 demonstrated an exaggeration of hearing loss in both ears. None of the 229 exhibited normal hearing bilaterally (Table 2).

Of the 229 individuals exhibiting nonorganic hearing loss, 166 (72.3%) were between 42 and 62 years of age; thus nonorganicity was displayed more frequently by the older members of this group than by the younger ones.

• **Dependents.** Our third group of subjects consisted of 1,025 dependents of retired and active-duty personnel from all the Armed Forces. These subjects ranged in age from 6.2 to 71.6, with a mean age of 34.6 and a median age of 23.6. Dependents under the age of 6 were not included in our data. The rarity of nonorganic hearing loss in children under 6, and the sometimes questionable reliability of hearing-threshold determinations for these individuals, prompted their exclusion from our data.

Of the 1,025 dependents studied, 127 (12.4%) had a nonorganic hearing loss or overlay (Table 1). Among those 127 were 71 (55.9%) with an alleged bilateral loss of hearing (Table 2). Nine (7.0%) of the 127 had bilateral normal hearing. Seven (77.7%) of these 9 claimed a unilateral hearing loss.

Discussion

We were interested in finding the incidence of nonorganicity in individuals complaining of a hearing loss. We expected the incidence to be higher in these indi-

TABLE 2. Type of Nonorganic Hearing Loss in Subject Groups

Subjects	Nonorganic Loss	Alleged Unilateral Loss	Alleged Bilateral Loss	Bilaterally Normal
Recruits	382	143 (37.5%)	215 (56.4%)	24 (6.1%)
Retired/active duty	229	83 (36.4%)	146 (63.6%)	None
Dependents	127	71 (55.9%)	47 (37.1%)	9 (7.0%)
TOTAL	738	297 (40.2%)	408 (55.3%)	33 (4.5%)

viduals, and this was certainly true of our recruit population. It was also true, to a lesser degree, of the other two groups.

The high percentage (74.6%) of nonorganic hearing loss in our recruit population was not unexpected. This group is highly motivated to exaggerate hearing problems in order to ease the stressful training situation with which they are confronted. The incidence of nonorganic hearing loss in our recruit population is much higher than in any other group we have evaluated. In 1956, Johnson et al. (2) estimated that between 11% and 45% of all veterans with service-connected hearing losses exaggerate their loss, but even Johnson's maximum percentage is well below the 74.6% found in our recruits.

The retired and active-duty group demonstrated a much lower incidence of nonorganic hearing loss (16.3%) than the recruit group. The 16.3% is well within Johnson's estimate.

In the retired and active-duty group, the vast majority of cases of nonorganic hearing loss were found among individuals 42 to 62 years of age. This may be because many individuals retire from the military during these years, and the exaggeration of hearing loss may be an attempt to increase retirement benefits or to increase compensation already being received.

There was a low incidence of nonorganic hearing loss among retired and active-duty personnel between the ages of 18 and 38. During these years, the individual is usually becoming involved in his military career. Unless the hearing loss is severe enough to hinder communication, the thought of exaggerating it is not likely to occur.

Of our dependent population, 12.4% exhibited nonorganic hearing loss. This is a higher incidence than expected from this group. A slight majority (50.3%) of this group were between the ages of 12 and 25, and were female. The reason for this is not clear, since these individuals do not receive any tangible benefits for hearing loss.

In two of the three groups—the recruit and retired/active-duty groups—alleged bilateral hearing loss was more prevalent than alleged unilateral hearing loss, even though unilateral hearing loss is easier to simulate. Since many hearing impairments in the military are caused by noise exposure or noise trauma, which usually produces a bilateral hearing loss, most of the nonorganic hearing losses in this group are exaggerations of existing bilateral hearing impairments. While hearing loss due to noise exposure is not always sym-

metrical, it is usually bilateral.

The dependent group demonstrated more unilateral nonorganic hearing impairments than bilateral ones. When we examined their health records, we discovered that most of these individuals were exaggerating middle-ear impairments, which are often unilateral. Thus, exaggeration of the unilateral hearing loss prevails in this group.

A large majority (81.8%) of the individuals in our study who demonstrated normal hearing bilaterally claimed a unilateral hearing loss. The most likely reason for this is the ease with which a unilateral loss can be simulated.

Some hearing loss was present in each individual of the retired/active-duty group. The reason for this is unclear, but one explanation may be that individuals in this group are usually older and have been exposed over the years to considerably more noise than members of the other two groups, and both these factors contribute to hearing loss.

Summary

Nonorganic hearing loss was most prevalent in our recruit population, and more prevalent in our retired/active-duty group than in the dependent group. Besides the recruit, the individual most likely to exaggerate a hearing loss in our clinic is the active-duty subject nearing retirement. Next most likely to do so is the retiree seeking to increase his chances for compensation for a service-connected hearing loss, and he is followed by the dependent female between the ages of 12 and 25.

All physicians should be aware of the possibility of nonorganic hearing loss in military personnel. If nonorganicity is suspected, the patient should be referred to an otolaryngologist for further diagnostic testing, and to an audiologist for accurate measurement of his hearing.

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'Radiation Cystitis': Benign or Malignant Complication?

LCDR R.E. Duncan, MC, USNR

Radiotherapy is used widely in the treatment of pelvic malignancies, including tumors of the cervix, bladder, rectum, and prostate. For example, of the 20,000 new cases of carcinoma of the uterine cervix that were discovered in the United States in 1976 (1), 80% received radiotherapy (2).

The purpose of irradiation may be curative, adjunctive to surgery, or palliative. Radiotherapy may be given in combination with chemotherapy. In any case, irradiation of tumors within the pelvis places adjacent organs at risk of radiation reactions (3, 4). The effects of radiotherapy may also be systemic (5, 6).

Bladder complications from pelvic irradiation were first documented in 1927 (7). The clinical course and pathological changes in the bladder of the patient undergoing pelvic irradiation are now well known. Both benign and malignant bladder reactions are possible.

Benign radiation reactions

Benign bladder complications occur in 1% to 4% of patients undergoing pelvic irradiation (8).

- **Acute cystitis** may develop within four to six weeks after therapy is initiated. Bladder capacity is reduced. The mucosa appears erythematous. Histologically, injury to basal germinal epithelial cells, hyperemia, injury to the fine vasculature and connective tissue, interstitial edema, and epithelial desquamation may be seen.

- **Subacute trigonal ulceration** may develop suddenly, six months to two years after irradiation. The patient complains of painless hematuria, which may be severe. Grossly, telangiectases are surrounded by circumscribed areas of blanching. Involvement of larger vessels leads to increased necrosis of tissue and deeper

ulceration. Calcifications develop.

Histologically, the urothelium is irregularly atrophic and hyperplastic, as are subepithelial vascular and connective tissue components. Marked proteinaceous interstitial edema and a mixed cellular infiltrate may be present.

- **Chronic fibrosis** may lead to a contracted bladder and ureteral strictures, secondary to scarring of the intravesical portion of the ureter, within one to five years after radiotherapy. These complications are frequently associated with urinary infection. Patients complain of severely reduced bladder capacity. The bladder mucosa appears atrophic and ulcerated. Fissures or fistulas may be present.

Histologically, the vessels are sclerotic and occluded within increasing subepithelial connective tissue. "Irradiation fibroblasts" are numerous. Differentiation between benign radiation reaction and carcinoma is difficult at this time. Cytopathologists have found it impossible to distinguish malignant from nonmalignant irradiated urothelial cells in urinary specimens.

Secondary ureteral entrapment and obstruction ultimately lead to pyelonephritis and renal insufficiency.

Radiation-induced bladder tumors

Evidence is accumulating that patients receiving therapeutic irradiation are at increased risk to develop other primary tumors. A similar situation exists for patients immunosuppressed after organ transplantation (9).

In the context of the present discussion, a group of patients who developed bladder tumors after pelvic irradiation for carcinoma of the cervix has been identified (10). The incidence in this group was found to be 299.9 per 100,000—an incidence 57.6 times greater than that in a comparable group in the general population.

The mean interval between irradiation and identification of the vesical malignancy was nine years. Gross

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hematuria was the most common symptom. Changes in the excretory urogram (IVP) were noted in 50% of the cases. Lesions were most commonly found on the bladder floor.

The prognosis for these patients appeared to be the same as for patients with similar tumor types in the general population.

Conclusions

Radiation-induced neoplasms are difficult to identify accurately because they are indistinguishable morphologically from naturally occurring lesions. Irradiation may cause premature development of age-dependent neoplasms or enhance the lifetime incidence of a tumor.

The induction time of a specific tumor after radiation injury is variable, although it is usually greater than five years.

Although doses greater than 7,000 rads appear to enhance benign vesical complications, the critical dose for development of a bladder malignancy in this setting is unknown.

It is important to carefully examine patients presenting with radiation reactions of the bladder, in order to rule out radiation-induced malignancy—now that this is

known to occur—as well as recurrent primary tumor. In addition, one is constantly reminded to weigh the possible risks of therapy against its advantages.

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Address all mail to Editor, *U.S. Navy Medicine*, Department of the Navy, Bureau of Medicine and Surgery (Code 0010), Washington, D.C. 20372.

Thanks!

COOPERATIVE CARE INSTITUTED . . . The Department of Defense has inaugurated a new health plan that authorizes CHAMPUS to share the cost of many services and supplies provided by civilian medical facilities to individuals remaining under primary care from a military medical facility. The new plan, known as "cooperative care," went into effect on 1 July and is retroactive to 1 June 1977.

In the past, CHAMPUS benefits were considered only when a patient had been completely released from the jurisdiction of a service medical facility. The patient would bear a portion of the cost, and CHAMPUS would pay the remainder.

Now cooperative care can be used when a service medical facility determines that a portion of required medical care cannot be provided by that facility or any local federal medical facility for which the patient is eligible. To be considered for cooperative care, the benefit must fall under CHAMPUS authorized care.

These are some of the services that may be obtained from civilian sources under the cooperative care program:

- Authorized nondiagnostic medical services, such as physical therapy, speech therapy, and radiation therapy.
- Psychotherapeutic/psychiatric care.
- All care under the CHAMPUS program for the handicapped.

Certain types of medical care provided by civilian sources, when the patient remains under primary control of a service medical facility that cannot provide complete care, will continue to be funded through the direct care system.

Details on the cooperative care plan are available from local CHAMPUS representatives.

STROKE-CARE GUIDE . . . A new guide—*Fundamentals of Stroke Care*—has been issued by the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS), National Institutes of Health.

The 442-page, soft-cover book results from a 10-year effort by the Joint Committee for Stroke Facilities to develop authoritative guidelines for appropriate medical care (prevention, diagnosis, treatment, and rehabilitation) of potential and actual victims of stroke. The

joint committee—which includes leaders in the field of stroke and representatives of national professional organizations working on the problem—was spearheaded by the American Neurological Association and funded by the Regional Medical Programs Service and NINCDS.

Navy doctors may obtain single copies of the new book free, for as long as the supply lasts, from the Office of Scientific and Health Reports, NINCDS, National Institutes of Health, Building 31, Room 8A06, Bethesda, Md. 20014. The book can also be ordered, for \$6.50, from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

FLIGHT SURGEON POLICY . . . The Chief of Naval Operations has recently reaffirmed the policy that allows flight surgeons to be in actual control of aircraft as part of their practice of occupational and preventive medicine. This policy has been promulgated in CNO 252228Z MAY 78.

IMMUNIZATION FILM . . . "A Gift, an Obligation" is a 16-mm color-and-sound film designed to explain to parents why it is vital to have their children vaccinated against the common childhood diseases.

The 30-minute film, produced for the American Academy of Pediatrics, is available free on loan to health care groups. Write to West Glen Films, 565 Fifth Avenue, New York, N.Y. 10017.

AUDIT TIPS . . . A recently completed audit uncovered the following discrepancies:

- Security of supply storerooms and limited-access areas was inadequate to prevent unauthorized entry and theft of accountable stock (NAVSUP Manual, par. 27005-5a).
- Returning to the supply system polystyrene packing acquired from incoming supply shipments would result in a cost avoidance of \$4,800.
- Establishment of a formal pallet-control program would alert personnel to the advantages of returning serviceable pallets to the supply system for reuse (NAVSUPINST 4450.23).

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